Preliminary Report on Time of Leaf Infection by Citrus Greasy Spot Fungus.

By

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Introduction

Greasy spot of citrus in this island was first recorded by Lo *et al.* in 1953 (3). At that time, the causal organism was not recognized, nor was the injuries of citrus regarded as a serious problem. Recently, Sun and Jeng stated that greasy spot has become as one of the most common diseases of citrus in Taiwan (5). It attacks citrus leaves and causes early defoliation, consequently growth of trees is deterred and fruit yield decreased. They obtained pure culture of *Cercospora citri-grisea* Fisher from diseased leaves and confirmed the pathogenicity of the isolates by inoculation on Ponkan and Sunki seedlings. So far, information concerning epidemiology of the disease is still not available in this island and needed to be elucidated.

This paper presents the preliminary results of spraying experiments for time of leaf infection by the causal organism.

Materials and Methods

A randomized block experiment with four replications was established at a Ponkan orchard located at Heng-shan Village, Hsin-chu Prefecture. Zinc ethylene-bisdithiocarbamate (zineb) was applied at the concentration of 25 gms per 10 liters water. Two sets of staggered sprays (4) of zineb were initiated on March 15 and June 1 respectively (Table 1). At the beginning of September, ten branches per tree were examined for the severity evaluation. For the rating of disease severity, 4 grades, 0, 1, 2, and 3 corresponding to leaf area damaged (none, light, medium and severe) were used.

Results

The results obtained in the spraying experiments are given in Table 2. Significant control effect of the disease was noted among the treatments before May 15. Only slight injuries were recognized on the spring flushes of these treatments. On the contrary, on the flushes of treatments after June 1, the injuries by the disease were very distinguished.

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The disease was satisfactorily controlled with two applications of zineb spray in April. This suggested that the leaf infection by the fungus was established mainly in April and no further infection took place after June 1.

Table 1. Spray dates for application of zineb at 25 gms/10 liters water to Ponkan trees, 1966

Treatment	Mar.	April		May		June		July		August	
	15	1	15	1	15	1	15	1	15	1	15
A	X	X	X	X	X						
B		X	X	X	X						
C			X	X	X						
D		X	X	X							
E		X	X								
F						X	X	X	X	X	X
G							X	X	X	X	X
H								X	X	X	X
I							X	X	X	X	
J							X	X	X		
K							X	X			
L	Control-No sprays										

Table 2. The severity of greasy spot disease on the spring flushes sprayed at various times with zineb (see Table 1), randomized block design with four replicates of single tree plots

Treatment	Branches examined	Severity of greasy spot	Significance[2] (.05 level)
A	40	0.025[1]	
B	40	0.225	
C	40	0.25	
D	40	0.275	
E	40	0.475	
H	40	1.175	
F	40	1.3	
I	40	1.625	
K	40	1.625	
G	40	1.75	
J	40	1.95	
L	40	2.075	

1. Average of 40 branches
2. Means compared by Duncan's multiple range test.
   Means connected by the same line do not differ significantly.
   Means not connected by the same line are significantly different.

Discussion and Conclusion

According to the report cited by Fawcett (1), Japanese citrus growers were controlling the greasy spot of citrus with Bordeaux mixture in June, after the flushes of new growth has formed. By this method the disease was greatly reduced. Fisher (2) reported that in ordinary years, zineb treatments were effective throughout July, yet under excessive moisture condition throughout the spring and summer, control measure should be applied at the earlier dates. This suggests that time of leaf infection by the fungus is greatly influenced by the climatic conditions.

In the investigations made by the author in early July, greasy spot could be found on the spring flushes of non-sprayed trees and trees of zineb spray after June 1. No lesion was observed on the flushes of summer foliage.

The experimental results revealed that the greasy spot of citrus could be controlled by two applications of zineb spray in April before the establishment of the infection. However, the influence of climate conditions on the time of leaf infection needs further studies.

Summary

Experiments carried out in a Ponkan orchard located in the northern part of Taiwan revealed that greasy spot of citrus could be controlled by two applications of zineb (zincethylebisdithiocamate) spray in April. This fact suggests that the time of citrus leaf infection by the greasy spot fungus is in April under the climatic conditions of 1966.

Literature Cited

1. Fawcett, H.S. 1936. Citrus diseases and their control. 656 p. 187 figs. McGill-Hill Book Co., New York, U.S.A.
2. Fisher, F.E. 1961. Greasy spot and tar spot of citrus in Florida. Phytopathology 51:297—303
3. Lo, T.C., S.C. Chang, K.S. Kung, and R.J. Chiu. 1952. Survey of citrus diseases and insects in Taiwan. (in Chinese). Jour. Agr. & Forestry. (Taiwan) 1:78—126
4. McOnie, K.C. 1964. Source of inoculum of *Guignardia citricarpa*, the citrus black spot pathogen. Phytopathology 54:64—67
5. Sun, S.K. and S.S. Jeng. 1966. Preliminary studies on greasy spot of citrus in Taiwan. (In Chinese with English summary). Bull. Soc. Plant Path. (Taichung, Taiwan) 1(2):1—7
6. Tanaka, S. and S. Yamada. 1952. Studies on the greasy spot (Black Melanose) of citrus. I. Confirmation of the causal fungus and its taxonomic study. (in Japanese with English summary). Natl. Tokai-kinki Agr. Exp. Sta. Hort. Div. Bull. 1:1—15

柑桔油脂病病原菌侵入期之初步試驗報告

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摘 要

據於臺灣北部之椪柑果園內進行之藥劑撒佈試驗之結果，於四月中撒佈鋅乃浦劑二次則可得防治柑桔油脂病發生之效。由此結果可以看出，在 1966 年之氣候條件下，柑桔油脂病之病原菌之侵入柑葉之時期在四月間。

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